

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please CANCEL claims 7, 8, 32, and 33, without prejudice or disclaimer, and AMEND claims 1-3, 6, 9-14, 20, and 29-31 in accordance with the following:

1. (CURRENTLY AMENDED) A testing apparatus for an integrated circuit comprising:
 - a pattern generator built in said integrated circuit to generate pseudo random patterns as test patterns;
 - a plurality of shift registers configured with sequential circuit elements inside said integrated circuit; and
 - an automatic test pattern generating unit to generate ATPG patterns; and
 - a pattern modifier for modifying said test patterns to modify a portion, to which a predetermined value is required to be set in order to detect a fault, in said pseudo random patterns generated by said pattern generator according to an external input, on a basis of said ATPG patterns, and inputting to input said modified test patterns pseudo random patterns to said shift registers.
2. (CURRENTLY AMENDED) A testing apparatus for an integrated circuit comprising:
 - a plurality of shift registers, to which test patterns are inputted, configured with sequential circuit elements inside said integrated circuit;
 - a mask for masking to convert an indeterminate value in outputs from said shift registers into a state value of "0" or "1" to mask said indeterminate value; and
 - an output verifier for verifying to verify output results in which said indeterminate value is masked by said mask, said output results not containing said indeterminate value.
3. (CURRENTLY AMENDED) A testing apparatus for an integrated circuit comprising:
 - a pattern generator built in said integrated circuit to generate pseudo random patterns as

test patterns;

a plurality of shift registers configured with sequential circuit elements inside said integrated circuit;

an automatic test pattern generating unit to generate ATPG patterns; and

a pattern modifier for modifying to modify a portion, to which a predetermined value is required to be set in order to detect a fault, in said pseudo random patterns said test patterns generated by said pattern generator according to an external input, on a basis of said ATPG patterns, and inputting said modified test patterns pseudo random patterns to said shift registers;

a mask for masking to convert an indeterminate value in outputs from said shift registers into a state value of "0" or "1" to mask said indeterminate value; and

an output verifier for verifying to verify output results in which said indeterminate value is masked by said mask, said output results not containing said indeterminate value.

4. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 2, wherein said output verifier includes a compressing means for compressing said masked output results.

5. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 3, wherein said output verifier includes a compressing means for compressing said masked output results.

6. (CURRENTLY AMENDED) A testing method for an integrated circuit comprising the steps of:

generating pseudo random patterns as test patterns by a pattern generator built in said integrated circuit;

generating ATPG patterns;

modifying a portion, to which a predetermined value is required to be set in order to detect a fault, in said generated pseudo random patterns on a basis of said ATPG patterns said generated test patterns according to an external input; and

inputting said modified test patterns pseudo random patterns to a plurality of shift registers configured with sequential circuit elements inside said integrated circuit.

7-8 CANCELLED

9. (CURRENTLY AMENDED) The testing apparatus according to ~~claim 7~~claim 1, wherein said pattern modifier selects a suitable combination of one pseudo random pattern and one ATPG pattern from said pseudo random patterns generated by said pattern generator and said ATPG patterns ~~as said external input~~, and modifies said selected pseudo random pattern on the basis of said selected ATPG pattern.

10. (CURRENTLY AMENDED) The testing apparatus according to ~~claim 8~~claim 3, wherein said pattern modifier selects a suitable combination of one pseudo random pattern and one ATPG pattern from said pseudo random patterns generated by said pattern generator and said ATPG patterns ~~as said external input~~, and modifies said selected pseudo random pattern on the basis of said selected ATPG pattern.

11. (CURRENTLY AMENDED) The testing apparatus according to ~~claim 7~~claim 1, wherein said automatic test pattern generating unit refers to each of said pseudo random patterns generated by said pattern generator, selects a suitable target fault according to each of said pseudo random patterns, and generates an ATPG pattern, with which said target fault can be detected, as a reference for modifying each of said pseudo random patterns.

12. (CURRENTLY AMENDED) The testing apparatus according to ~~claim 8~~claim 3, wherein said automatic test pattern generating unit refers to each of said pseudo random patterns generated by said pattern generator, selects a suitable target fault according to each of said pseudo random patterns, and generates an ATPG pattern, with which said target fault can be detected, as a reference for modifying each of said pseudo random patterns.

13. (CURRENTLY AMENDED) The testing apparatus according to ~~claim 7~~claim 1 further comprising:

a characteristic information determining unit ~~for comparing to~~ compare said pseudo random patterns generated by said pattern generator with said ATPG patterns ~~as said external input to determine characteristic information on said pattern generator with which said pattern generator can generate pseudo random patterns analogous to said ATPG patterns;~~

wherein said pattern generator generates said pseudo random patterns on the basis of said characteristic information determined by said characteristic information determining unit.

14. (CURRENTLY AMENDED) The testing apparatus according to ~~claim 8~~claim 3

further comprising:

a characteristic information determining unit ~~for comparing~~ to compare said pseudo random patterns generated by said pattern generator with said ATPG patterns ~~as said external input~~ to determine characteristic information on said pattern generator with which said pattern generator can generate pseudo random patterns analogous to said ATPG patterns;

wherein said pattern generator generates said pseudo random patterns on the basis of said characteristic information determined by said characteristic information determining unit.

15. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 13, wherein said characteristic information is a seed value to be set to said pattern generator.

16. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 14, wherein said characteristic information is a seed value to be set to said pattern generator.

17. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 13, wherein said pattern generator is configured as a linear feedback shift register, and said characteristic information is a feedback position in said linear feedback shift register.

18. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 14, wherein said pattern generator is configured as a linear feedback shift register, and said characteristic information is a feedback position in said linear feedback shift register.

19. (PREVIOUSLY PRESENTED) The testing apparatus according to ~~claim 7~~ claim 1 further comprising an execution limitation condition setting unit for setting, when said automatic test pattern generating unit executes a compressing process on said ATPG pattern, an execution limitation condition for limiting the execution of said compressing process;

wherein said automatic test pattern generating unit terminates said compressing process on said ATPG pattern when said execution limitation condition set by said execution limitation condition setting unit is satisfied.

20. (CURRENTLY AMENDED) The testing apparatus according to ~~claim 8~~ claim 3 further comprising an execution limitation condition setting unit for setting, when said automatic test pattern generating unit executes a compressing process on said ATPG pattern, an execution limitation condition for limiting the execution of said compressing process;

wherein said automatic test pattern generating unit terminates said compressing process on said ATPG pattern when said execution limitation condition set by said execution limitation condition setting unit is satisfied.

21. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 19, wherein said execution limitation condition setting unit sets, as said execution limitation condition, an upper limit value of the number of faults to be detected with one ATPG pattern, and said automatic test pattern generating unit terminates said compressing process on said ATPG pattern when the number of detection target faults, that are compressed in said ATPG pattern by said compressing process, reaches said upper limit value.

22. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 20, wherein said execution limitation condition setting unit sets, as said execution limitation condition, an upper limit value of the number of faults to be detected with one ATPG pattern, and said automatic test pattern generating unit terminates said compressing process on said ATPG pattern when the number of detection target faults, that are compressed in said ATPG pattern by said compressing process, reaches said upper limit value.

23. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 21, wherein said execution limitation condition setting unit increases said upper limit value as generation of said ATPG pattern progresses.

24. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 22, wherein said execution limitation condition setting unit increases said upper limit value as generation of said ATPG pattern progresses.

25. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 19, wherein said execution limitation condition setting unit sets, as said execution limitation condition, an upper value of a quantity of pattern modification by said pattern modifier in the case where said pattern modifier modifies one of said pseudo random patterns on the basis of one ATPG pattern, and said automatic test pattern generating unit terminates said compressing process on said ATPG pattern when a quantity of pattern modification, performed by said pattern modifier in the case where said pattern modifier modifies said pseudo random pattern on the basis of one ATPG pattern in which detection target faults are compressed by said compressing

process, reaches said upper limit value.

26. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 20, wherein said execution limitation condition setting unit sets, as said execution limitation condition, an upper value of a quantity of pattern modification by said pattern modifier in the case where said pattern modifier modifies one of said pseudo random patterns on the basis of one ATPG pattern, and said automatic test pattern generating unit terminates said compressing process on said ATPG pattern when a quantity of pattern modification, performed by said pattern modifier in the case where said pattern modifier modifies said pseudo random pattern on the basis of one ATPG pattern in which detection target faults are compressed by said compressing process, reaches said upper limit value.

27. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 25, wherein said execution limitation condition setting unit increases said upper limit value as generation of said ATPG pattern progresses.

28. (PREVIOUSLY PRESENTED) The testing apparatus according to claim 26, wherein said execution limitation condition setting unit increases said upper limit value as generation of said ATPG pattern progresses.

29. (CURRENTLY AMENDED) An integrated circuit including sequential circuit elements having:

a plurality of shift registers configured with said sequential circuit elements;

~~a pattern generator built in said integrated circuit to generate~~to generate pseudo random patterns as test patterns; and

an automatic test pattern generating unit to generate ATPG patterns; and

~~a pattern modifier built in said integrated circuit to modify said test patterns~~to modify a portion, to which a predetermined value is required to be set in order to detect a fault, in said pseudo random patterns generated by said pattern generator according to an external input, on a basis of said ATPG patterns given from said automatic test pattern generating unit, and
~~inputting to input said modified test patterns~~pseudo random patterns to said shift registers.

30. (CURRENTLY AMENDED) An integrated circuit including sequential circuit elements having:

a plurality of shift registers, to which test patterns are inputted, configured with said sequential circuit elements;

a mask ~~built in said integrated circuit to mask~~to convert an indeterminate value in outputs from said shift registers into a state value of "0" or "1" to mask said indeterminate value; and

an output verifier ~~built in said integrated circuit to verify output results in which said indeterminate value is masked by said mask, said output results not containing said indeterminate value.~~

31. (CURRENTLY AMENDED) An integrated circuit including sequential circuit elements having:

a plurality of shift registers configured with said sequential circuit elements;

a pattern generator ~~built in said integrated circuit to generate~~to generate pseudo random patterns as test patterns;

an automatic test pattern generating unit to generate ATPG patterns;

a pattern modifier ~~built in said integrated circuit to modify said test patterns~~to modify a portion, to which a predetermined value is required to be set in order to detect a fault, in said pseudo random pattern generated by said pattern generator according to an external input, on a basis of said ATPG patterns given from said automatic test pattern generating unit, and inputting said modified test patternspseudo random patterns to said shift registers;

a mask ~~built in said integrated circuit to mask~~to convert an indeterminate value in outputs from said shift registers into a state value of "0" or "1" to mask said indeterminate value; and

an output verifier ~~built in said integrated circuit to verify output results in which said indeterminate value is masked by said mask, said output results not containing said indeterminate value.~~

32 – 33 CANCELLED